IRIS-HEP Training, Education and Outreach (TEO)

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Goals

▷ IRIS-HEP - intellectual hub - software/computing challenges of HL-LHC era

▷ Building the necessary software and solving related challenging problems requires a workforce

  ▷ HEP domain knowledge + advanced software skills+ strong connections to other related disciplines

  ▷ Need investment to grow this workforce

▷ Training is critical to perpetuate the learning cycle in an organized way and efficiently

▷ Outreach the under(un)served community to develop wider interest

Impact Role

▷ Coordinate training related activities

▷ Assemble and communicate coherent vision of a training program for HEP community - graduate students, postdocs, senior researchers in software and computing

▷ Develop a process with the community for implementing and updating this vision over time

▷ Build a "federated" view over the possible training opportunities
   ▷ Experiments, labs, dedicated summer schools and other sources (HEP and non-HEP)

▷ Bring together the people organizing the training activities to articulate the vision, develop plans to enhance the sustainability, reusability and impact of the training activities

▷ Work with the community to build an assessment framework for the ensemble of activities that allows us to measure the impact of our activities

Training Vision Pyramid

HEP Software Training
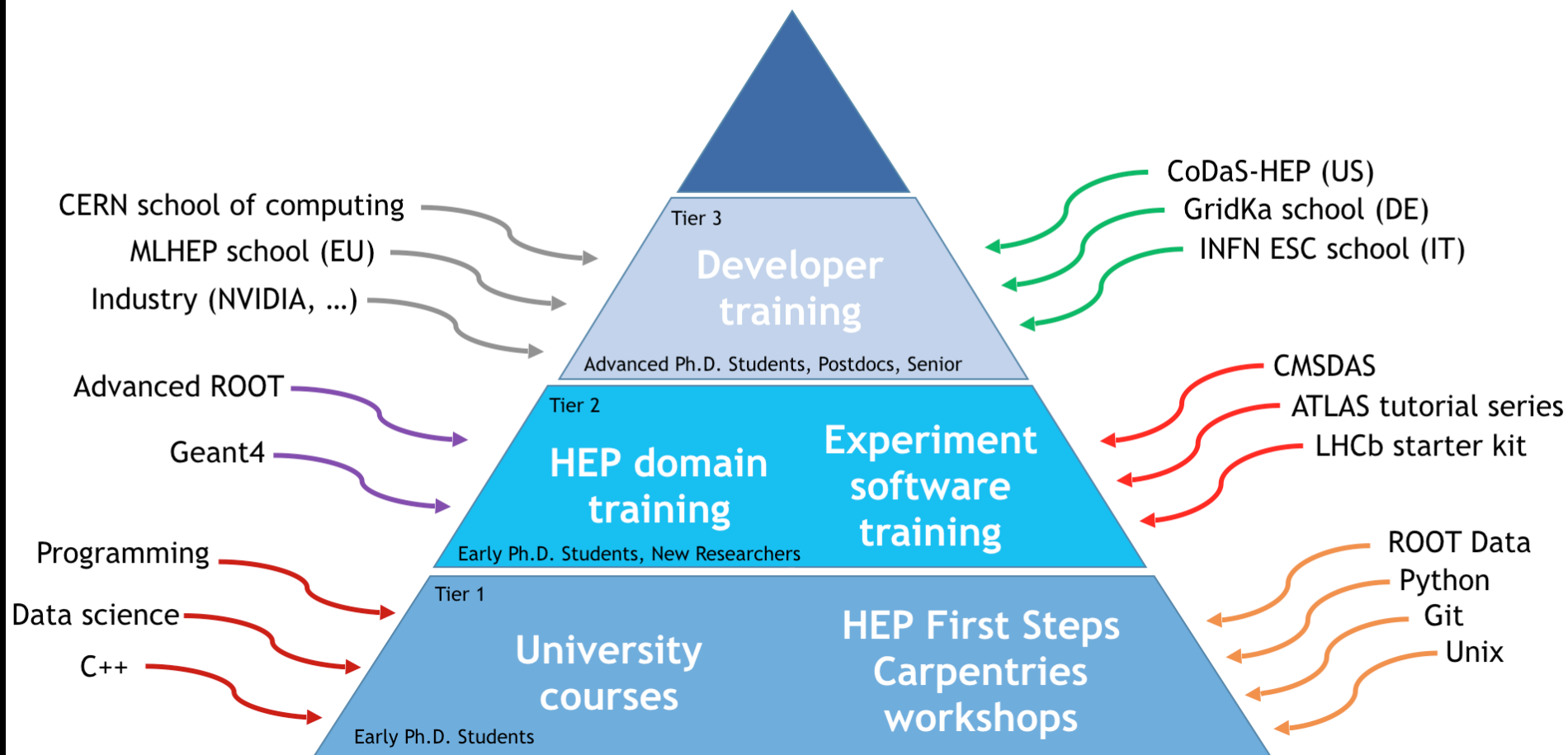
Tier-1 HEP curriculum

▷ Establish training elements to provide a uniform set of basic skills for all Common basics (Linux/Shell/Python/C++/ Git/ROOT, Machine Learning) for all HEP graduate students and postdocs, and broadening participation from institutions lacking such courses

▷ Establish a collaboration with "The Carpentries" rather than develop its own curriculum from the ground up, assemble an introductory HEP curriculum built out of existing Software Carpentry material and augmented by HEP-specific material training material.

▷ The collaboration with The Carpentries has two aspects
  ▷ Organize workshops to provide all U.S.-based HEP students and postdocs the opportunity to participate in a set of training course
  ▷ To collaborate with senior HEP researchers to become instructors for The Carpentries workshop
▷ Lead to a community converging on a "common good" curriculum for the introductory material

▷ IRIS-HEP/ FIRST-HEP has funds used to train the instructor pool

  ▷ Workshops will be organized at HEP institutions, either with a sufficient local audience to reach a large community or in conjuction with other community events, e.g. conferences, computing related workshops, experiment collaboration meetings, etc. Some fraction of the workshops will be held at the major HEP laboratories (Fermilab, CERN, etc.) and others at universities

software carpentry

▷ **https://carpentries.org**

Tier-2 HEP-domain specific training

▷ HEP-domain specific training exist already

  ▷ Appropriate for Ph.D. students,new researchers, mastered the basic skills, starting their research activities

  ▷ Work with partners to recognize and solve common problems
    ▷ Variability of basic skills knowledge, evolve the "First Steps" curriculum
    ▷ Gives natural pool of possible instructors

  ▷ Organize "Birds of a Feather" sessions at HEP conferences

    ▷ To increase the impact and sustainability of training activities
    ▷ Can combine ROOT/ Geant4 training to more visible intermediate-level "boot camp
    ▷ Make these tools more accessible outside of HEP?
    ▷ Modest fund for a pilot intermediate "boot camp" in U.S. on above/HEP-related tools

Tier-3 Developer Training

▷ For researchers

   ▷ Mastered basic and experiment specific skills

   ▷ Ready for research contribution/activities

   ▷ Develop innovative new methods

▷ Week long school

   ▷ Like-minded students, similar interests in
      computational problems
   ▷ Build collaborations, interact and find senior mentors
      professional development
   ▷ Example - CoDas-HEP, DIANA project

Near Term Step

▷ Organize introductory level Carpentry (scale it)

    ▷ Invite Carpentry team
    ▷ Target audience - CMS users? Place - FNAL?
    ▷ ATLAS could do one too
    ▷ Invite LHCb/ALICE to showcase Starterkit

▷ HEP Software/Computing Training Survey

    ▷ Intent - provide input on training needs
    ▷ Assess current training practices for HEP software/computing and rel software-centric areas.
    ▷ Information potentially used to seek resources, organize training
    ▷ activities to meet training needs
    ▷ Prior training experience, interest in possible training topics, aggregate summary information, will be made public.

Synergistic Info

▷ Closely training related project that recently got funded and timely aligns with our broader activity

▷ *"Framework for Integrated Research Software Training in High Energy Physics (FIRST-HEP)"* - 3 year funding - http://first-hep.org

  ▷ Training-based Workforce Development for Advanced Cyberinfrastructure (CyberTraining)